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## 中国不同湖泊水体透明度的遥感估算

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Water clarity (expressed as Secchi disk depth (SDD)) reflects light transmission capacity of a water body and influences growth of aquatic plants, aquatic organisms, and primary productivity. Here, we calibrated and validated a general model based on Landsat series data for deriving SDD of various inland waters across China. The quality of remotely sensed reflectance products from different Landsat series images was assessed using in situ reflectance measurements. The results indicated that the products in the visible bands are the most robust and stable to estimate SDD for inland waters. Subsequently, a simple power function model based on red band was built using

887 pairs of in situ SDD measurements and concurrent Landsat images. The model was validated with an independent dataset of 246 SDD measurements, and the results showed that the mean relative error and normalized root mean square error were 34.2% and 55.4%, respectively. Finally, the model was applied to Landsat images acquired between 2016 and 2018 to investigate the SDD spatial distribution of all lakes with water area  $\geq 10$  km<sup>2</sup> (total 641 lakes) in China. The estimation results demonstrated that the Eastern Plain Lake Zone and Northeast Plain Lake zone have relatively low SDD, with multiyear average SDD of  $0.56\pm 0.17$ m and  $0.47\pm 0.29$ m, respectively. The Yunnan-Guizhou Plateau Lake Zone and Tibetan Plateau Lake Zone have relatively high SDD, with multiyear average SDD of  $1.48\pm 0.86$ m and  $1.30\pm 0.83$ m, respectively. The results indicated that the proposed model exhibits strong ability to accurately construct SDD coverage for various lakes.

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